



**ONYX™-S2C**  
**TWO-COLOR RATIO**  
**OPTICAL TEMPERATURE PYROMETERS**  
PRECISION TEMPERATURE MEASUREMENT  
FOR DEMANDING INDUSTRIAL APPLICATIONS





**Accurate,  
repeatable,  
and reliable  
temperature  
measurement**  
under the  
harshest industrial  
conditions

## Onyx™-S2C Two-Color Ratio Optical Temperature Pyrometers

The new Onyx™ series meets the most demanding accuracy and repeatability requirements over a broad temperature range. Based on over 20 years of pyrometry and optical temperature measurement experience in some of the world's most demanding applications, the Onyx series provides measurement precision, repeatability, and reliability for industrial applications.

### EXPAND YOUR APPLICATION OPTIONS

Onyx-S2C pyrometers are available in a dual-wavelength configuration. This configuration is within the near-infrared range and is ideally suited for a wide variety of industrial materials and applications, such as measurement of steel, non-ferrous metals, graphites, silicon carbon (SiC), carbon fiber, and ceramics.

- Two-color measurement for emissivity independence and immunity to contaminants
- Stainless steel housing with IP65 protection class





## ENHANCED POINT-TO-POINT UNIFORMITY AND TEMPERATURE READING ACCURACY

Traditional thermocouple measurement is unsuitable for many applications where physical contact with the substrate is not possible, or where heat transfer effects cause measurement inaccuracies. Onyx-S2C systems measure the substrate or work piece directly, in-situ for enhanced point-to-point uniformity and temperature reading accuracy.

## ROBUST TWO-COLOR RATIO MEASUREMENT FOR EXCEPTIONALLY DEMANDING CONDITIONS

Onyx-S2C two-color pyrometers (also called *ratio, dual-wavelength, or emissivity-independent pyrometers*) offer robust performance, even when the target's thermal emission is uncertain due to unknown or changing emissivity, intervening surfaces, or undetermined field-of-view fill factor. Two-color Onyx-S2C pyrometers measure intensity at two discrete wavelengths and calculate the ratio of these values. This ratio enables accurate temperature measurement under these changing substrate or environmental conditions.

### Onyx™-S2C two-color pyrometers compensate for:

- › Emissivity changes
- › Window contamination
- › Small substrate size

## RUGGED CONSTRUCTION AND PERFORMANCE FOR HARSH ENVIRONMENTS

Built for harsh industrial conditions, Onyx-S2C pyrometers meet IP65 industrial protection classification and withstand environmental temperatures up to 70°C.

### OPTIONAL ACCESSORIES FOR THE HARSHTEST CONDITIONS

- › Water-cooling jacket
  - Enables continuous operation in temperatures up to 250°C
- › Air-purge collar
  - Enables consistent, accurate operation in contaminating environments by delivering a constant flow of air or purge gas across the pyrometer lens

### INSTALLATION AND ALIGNMENT

- › Integrated laser alignment
  - The Onyx-S2C pyrometer has an integrated laser that can be activated during installation to ensure optimal alignment of the pyrometer.
- › Optical alignment
  - The Onyx-S2C pyrometer can be ordered with an integrated optical alignment scope for installations in which it's not possible to use a laser, such as when the pyrometer is looking inside a processing furnace.

## ACCURATE MEASUREMENT REGARDLESS OF ENVIRONMENTAL CONDITIONS

Proprietary ambient-temperature calibration ensures ongoing temperature measurement accuracy across a wide range of ambient variation (5 to 70°C) by continuously monitoring each unit's internal temperature and automatically compensating for any temperature variation.

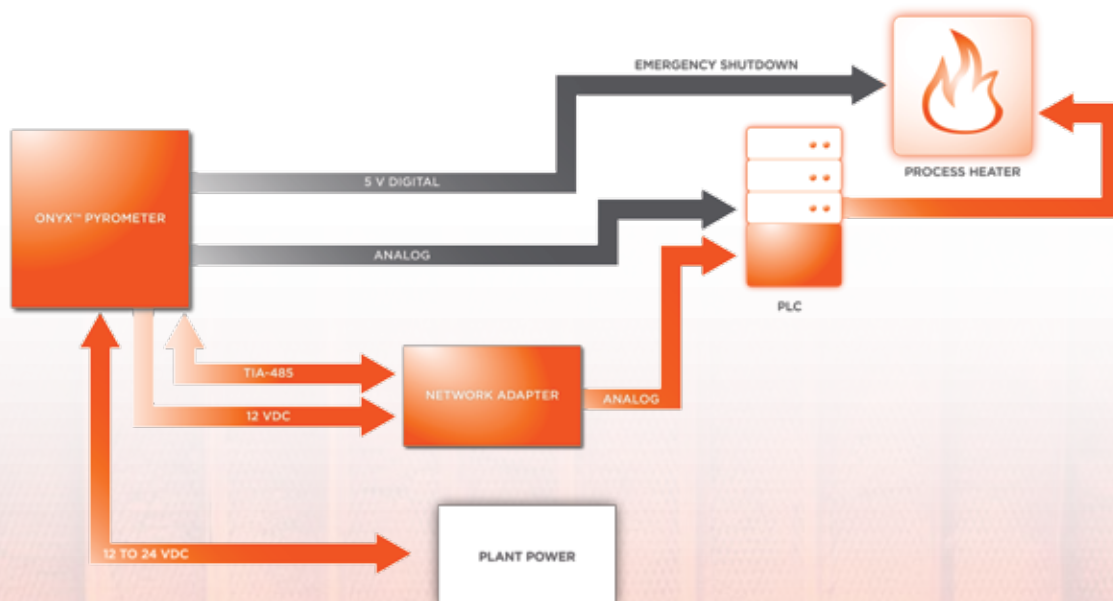
## EASY INTEGRATION AND COMMUNICATION

### EXTERNAL BUS MODULES

Onyx-S2C pyrometers integrate easily with the following communication protocols via external bus module:

- › Ethernet/IP®
- › Profibus® DPV1
- › DeviceNet™
- › CANopen®
- › PROFINET®
- › Modbus® TCP
- › Modbus® RTU

These bus modules meet IP65 requirements and can be installed adjacent to the pyrometer or in an equipment control rack in a remote location.



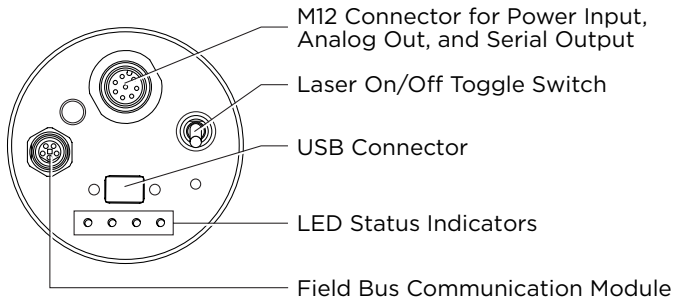
Communication Block Diagram



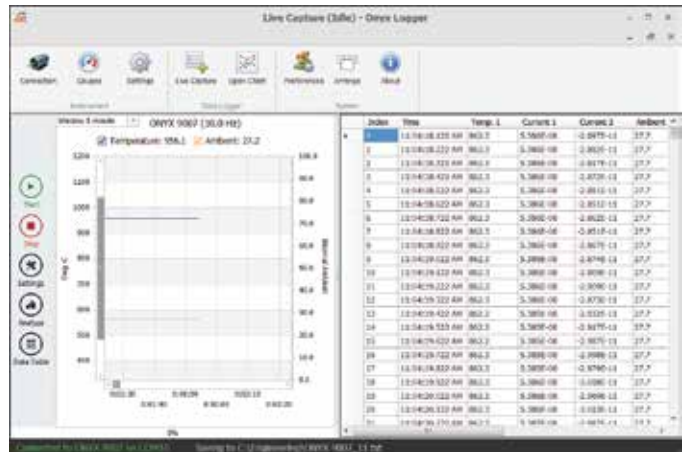


## USB CONNECTION

The Onyx-S2C pyrometer features a USB connector for easy communication, setup, troubleshooting, and local data collection.

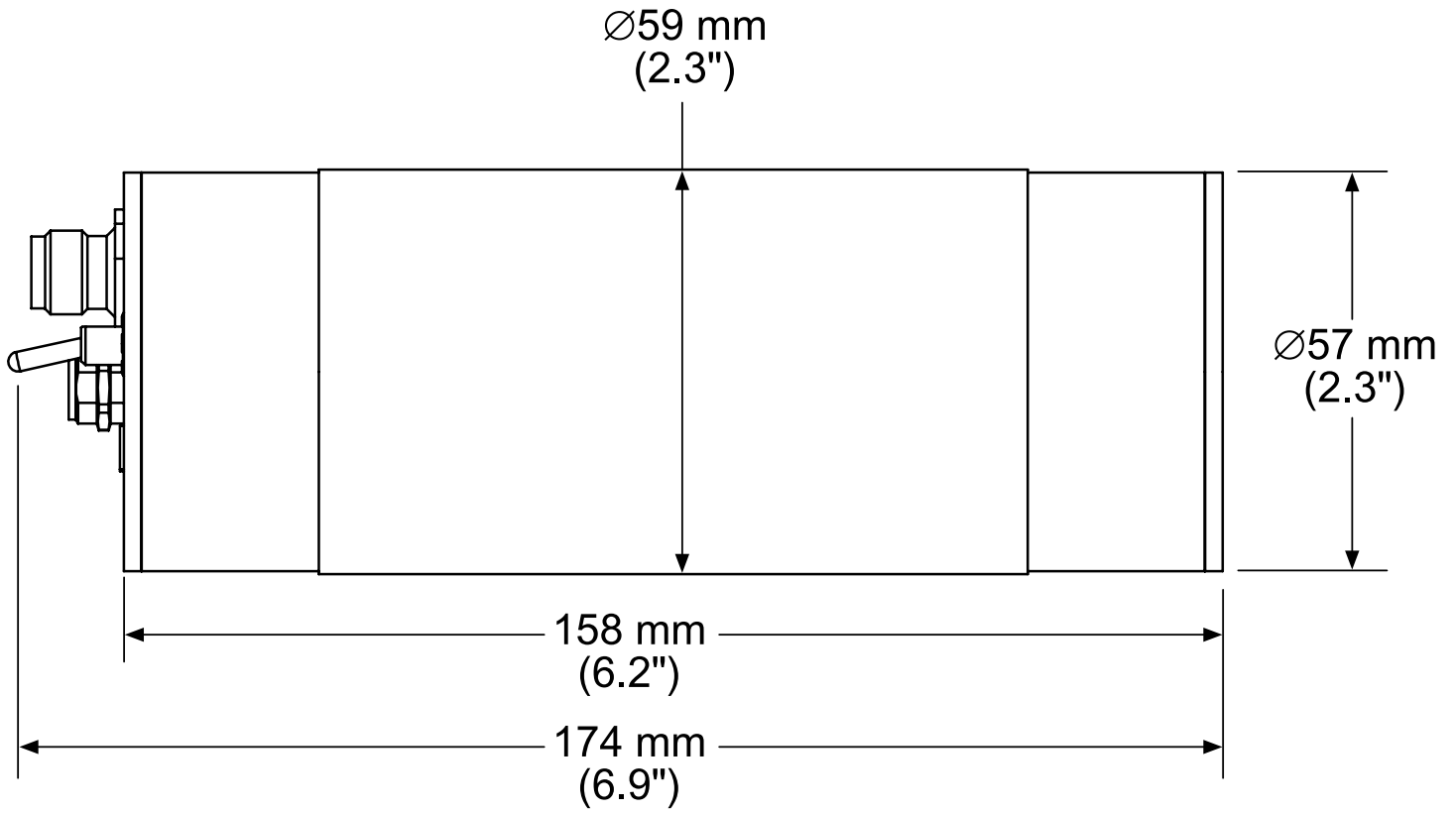


## CUSTOM DATA LOGGING SOFTWARE





SPECIFICATIONS		ONYX™-S2C PYROMETER	
<b>Detector Type</b>	Dual wavelength (two-color ratio)		
<b>Measurement</b>			
<b>Measurement Mode</b>	Two-color ratio or single-wavelength, selectable		
<b>Temperature Range</b>	600 to 1600°C		
<b>Emissivity</b>	0.05 to 1.0		
<b>Emissivity Slope (Two Color)</b>	0.8 to 1.2		
<b>Spectral Range</b>	Si/Si 950/1050 nm		
<b>Response Time</b>	1 msec to 10 sec		
<b>Accuracy</b>	±0.4% of reading in °C or 4°C		
<b>Resolution</b>	0.1°C		
<b>Sighting</b>	Laser or optical		
<b>Working Distance and Spot Size</b>			
<b>Configuration</b>	<b>Working Distance Range</b>	<b>Spot Size</b>	
<b>Short</b>	0.1 to 0.6 m (3.9 to 23.6")	10 to 19 mm (0.39 to 0.75")	
<b>Medium</b>	0.5 to 1.3 m (19.7 to 51.2")	14 to 20 mm (0.55 to 0.79")	
<b>Long</b>	1.0 to 3 m (3.3 to 9'10")	17 to 29 mm (0.66 to 1.14")	
<b>Specialized Small Spot Size</b>	0.1 to 1.0 m (3.9 to 39.4")	8 mm (0.31")	
<b>Communication</b>			
<b>Analog Out</b>	0 to 10 V, 0 to 20 mA, or 4 to 20 mA		
<b>Digital Interfaces</b>	Standard: RS-232/RS-485, USB Available: Modbus® TCP, Profibus®, Ethernet/IP®, DeviceNet™, Profinet®, Modbus® RTU		
<b>Environmental</b>			
<b>Ambient Temperature</b>	0 to 70°C (32 to 158°F)		
<b>Relative Humidity</b>	5 to 85% (non-condensing)		
<b>Storage Temperature</b>	-25 to 85°C (-13 to 185°F)		
<b>Protection Class</b>	IP65		
<b>Electrical</b>			
<b>Power Supply</b>	+24 VDC nominal, +15 to +30 VDC		
<b>Compliance</b>	CE		
<b>Physical</b>			
<b>Dimensions</b>	59 mm (2.3") diameter x 157.5 mm (6.2") length		
<b>Exterior Housing</b>	Stainless steel		
<b>Warranty Period</b>	12 months		
<b>Operation Position</b>	Any orientation		



For international contact information, visit [advanced-energy.com](http://advanced-energy.com).